

What is claimed is:

1. An image retrieving apparatus for retrieving an image similar to a predetermined query image out of subject videos for retrieval, comprising:

5 a frame feature vector extracting means for extracting a feature vector of at least a part of frames included in said subject videos for retrieval, and for outputting said extracted one as a frame feature vector;

10 a frame feature vector storing means for storing the frame feature vector outputted by said frame feature vector extracting means;

15 an image feature vector extracting means for extracting a feature vector of said query image and for outputting said extracted one as an image feature vector;

20 a similarity calculating means for comparing the frame feature vector stored in said frame feature vector storing means with the image feature vector outputted by said image feature vector extracting means to thereby calculate a similarity of both vectors;

25 a frame feature vector integrating means for integrating frame feature vectors out of those stored in said frame feature vector storing means that satisfy a predetermined condition on similarity into at least one group; and,

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a similar image selecting means for selecting  
at least one frame feature vector of a highest  
similarity out of the group integrated by said frame  
feature vector integrating means,

5 whereby images having the frame feature vector  
that is selected by said similar image selecting means  
is presented as a result of retrieval.

2. The image retrieving apparatus as set forth in  
10 claim 1, wherein said frame feature vector integrating  
means comprises:

15 a frame feature vector selecting means for  
selecting a frame feature vector of a similarity that is  
calculated by said similarity calculating means and is  
higher than a predetermined threshold value, out of  
frame feature vectors stored in said frame feature  
vector storing means; and

20 a similar segment generating means for  
integrating frame feature vectors that are continuous in  
time, out of the frame feature vectors selected by said  
frame feature vector selecting means, into one group and  
for outputting the integrated group.

3. An image retrieving apparatus for retrieving a  
25 video segment similar to a predetermined query video,  
out of subject videos for retrieval comprising:

a frame feature vector extracting means for extracting a feature vector of some or all frames, out of the subject videos for retrieval and for outputting the extracted one as a frame feature vector;

5 a frame feature vector storing means for storing the frame feature vector outputted by said frame feature vector extracting means;

a video feature vector extracting means for extracting a feature vector of some or all frames 10 included in said query video, and for outputting the extracted one as a first video feature vector;

a video feature vector cutout means for cutting out a frame feature vector corresponding to a time length that the query video inputted by said video 15 feature vector extracting means has, out of the frame feature vectors stored in said frame feature vector storing means, and for outputting the cutout one as a second video feature vector:

a similarity calculating means for comparing 20 said first video feature vector outputted by said video feature vector extracting means with said second video feature vector outputted by said video feature vector cutout means, to thereby calculate a similarity of both vectors;

25 a video feature vector integrating means for integrating the second video feature vectors, out of

those outputted by said video feature vector cutout means, that satisfy a predetermined condition on similarity into at least one group; and

5 a similar video segment selecting means for selecting at least one of the second video feature vector that has a highest similarity in the group integrated by said video feature vector integrating means,

10 whereby a video segment having the second video feature vector selected by said similar video segment selecting means is presented as a result of retrieval.

15 4. The image retrieving apparatus as set forth in claim 3, wherein said video feature vector integrating means comprising:

20 a video feature vector selecting means for selecting a second video feature vector of which a similarity calculated by said similarity calculating means is higher than a predetermined threshold value, out of second video feature vectors outputted by said video feature vector cutout means; and

25 a similar segment generating means for integrating the second video feature vectors that are either continuous in time or partially duplicate, out of those selected by said video feature vector selecting

means into one group, and for outputting the integrated group.

5. The image retrieving apparatus as set forth in  
5 claim 1, wherein said frame feature vector extracting  
means generates a resized image for at least a part of  
frames included in said subject videos for retrieval,  
and extracts a frame feature vector by applying a  
frequency conversion and a quantizing processing to said  
10 resized image.

6. The image retrieving apparatus as set forth in  
claim 2, wherein said frame feature vector extracting  
means generates a resized image for at least a part of  
15 frames included in said subject videos for retrieval,  
and extracts a frame feature vector by applying a  
frequency conversion and a quantizing processing to said  
resized image.

20 7. The image retrieving apparatus as set forth in  
claim 3, wherein said frame feature vector extracting  
means generates a resized image for at least a part of  
frames included in said subject videos for retrieval,  
and extracts a frame feature vector by applying a  
25 frequency conversion and a quantizing processing to said  
resized image.

8. The image retrieving apparatus as set forth in  
claim 4, wherein said frame feature vector extracting  
means generates a resized image for at least a part of  
5 frames included in said subject videos for retrieval,  
and extracts a frame feature vector by applying a  
frequency conversion and a quantizing processing to said  
resized image.

10 9. An image retrieving method of retrieving an  
image similar to a predetermined query image out of  
subject videos for retrieval, comprising the sequential  
steps of:

15 extracting a frame feature vector of at least  
a part of frames included in said subject videos for  
retrieval;

20 storing said extracted frame feature vector;  
extracting an image feature vector of said query image;  
comparing said frame feature vector with said image  
feature vector to thereby calculate a similarity of both  
vectors;

25 integrating frame feature vectors of which the  
similarities satisfy a predetermined condition on  
similarity into at least one group;

selecting at least one frame feature vector of  
the highest similarity in said integrated group; and

proposing an image having said selected frame feature vector as a result of retrieval.

10. The image retrieving method as set forth in  
5 claim 9, wherein the integration of said frame feature vectors into said group is implemented in such a manner that the frame feature vectors of which the similarities are higher than a predetermined threshold value are selected, and that out of said selected frame feature  
10 vectors, those that are continuous in time are integrated into one group.

11. An image retrieving method of retrieving a video segment similar to a predetermined query video out  
15 of subject videos for retrieval, comprising the sequential steps of:

extracting at least a part of frame feature vectors included in said subject videos for retrieval;  
storing extracted said frame feature vectors;

20 extracting a video feature vector of at least a part of frames included in said query video;

cutting out a video feature vector of a frame corresponding to a time length that said query video has, out of said frame feature vectors;

25 comparing said video feature vector extracted from said query video with the video feature vector cut

out from said frame feature vectors, to thereby calculate a similarity of both vectors;

integrating video feature vectors of which said similarities satisfy a predetermined condition, out 5 of the video feature vectors cut out from said frame feature vectors into at least one group;

selecting at least one video feature vector of a highest similarity in said integrated group; and proposing a video segment having said selected video 10 feature vector as a result of retrieval.

12. The image retrieving method as set forth in claim 11, wherein the integration of said video feature vectors into said group is implemented by the process 15 that the video feature vectors of which said similarities are higher than a predetermined threshold value are selected, and those that are either continuous in time or partly duplicate in the selected video feature vectors are integrated into one group.

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13. The image retrieving method as set forth in 9, wherein said frame feature vector is extracted in such a manner that a resized image is produced for at least a part of frames included in said subject video for 25 retrieval, and that a frequency conversion and a quantizing processing are applied to said resized image.

14. The image retrieving method as set forth in 10,  
wherein said frame feature vector is extracted in such a  
manner that a resized image is produced for at least a  
5 part of frames included in said subject video for  
retrieval, and that a frequency conversion and a  
quantizing processing are applied to said resized image.

15. The image retrieving method as set forth in 11,  
10 wherein said frame feature vector is extracted in such a  
manner that a resized image is produced for at least a  
part of frames included in said subject video for  
retrieval, and that a frequency conversion and a  
15 quantizing processing are applied to said resized image.

16. The image retrieving method as set forth in 12,  
wherein said frame feature vector is extracted in such a  
manner that a resized image is produced for at least a  
part of frames included in said subject video for  
20 retrieval, and that a frequency conversion and a  
quantizing processing are applied to said resized image.

17. A recording medium, wherein a program  
permitting a computer to implement the image retrieving  
25 method as set forth in claim 9 is written therein.

18. A recording medium, wherein a program permitting a computer to implement the image retrieving method as set forth in claim 10 is written therein.

5 19. A recording medium, wherein a program permitting a computer to implement the image retrieving method as set forth in claim 11 is written therein.

10 20. A recording medium, wherein a program permitting a computer to implement the image retrieving method as set forth in claim 12 is written therein.

15 21. A recording medium, wherein a program permitting a computer to implement the image retrieving method as set forth in claim 13 is written therein.

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